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Supporting Information

Copolymerization Induced Emission of Poly[(methylenelactide)-*co*-(2-vinylpyridine)]

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Figure S1. (a) ¹H NMR spectra of PLVPs, PMAL and P2VP. (b) FT-IR spectra of PLVPs, PMLA and P2VP.



Figure S2. (a) The GPC curve of PLVPs. (b) The GPC curve of different molecular weight PLVP-3.



Figure S3. Original PL spectra of PLVP-3 in different solvents, concentration 1.0 mg /mL.



Figure S4. The fluorescence lifetime decay curves of PLVPs in DMF solution. Concentration: 1 mg/mL.



Figure S5. Original PL spectra of PLVPs in DMF solution, concentration 1.0 mg/mL.



Figure S6. Original PL spectra of PLVPs in DMF solution, concentration 1.0 mg/mL.



Figure S7. The absorption spectra of PLVPs in ACN solution.



Figure S8. The absorption and PL spectra of PMLA, P2VP and PMLA/P2VP blend in ACN solution.



Figure S9. Original PL spectra of PLVPs with similar monomer ratio but different molecular weight in DMF solution.



Figure S10. (a) The fluorescence lifetime decay curves of PLVP-3 with different molecular weights. (b) Fluorescence lifetime decay curve of different concentrations of PLVP-3M.



Figure S11. PL spectra of PLVP-3 in DMF/H₂O mixture with different H₂O fractions. Concentration: 0.1 mg/mL. Excitation wavelength: 350 nm.



Figure S12. Normalized UV-vis spectra of MLA and 2VP in ACN.



Figure S13. (a) Normalized PL spectra of PLVP-3 with different concentrations in DMF solution. (b) The dependence of emission wavelength of PLVP-3 on the solution concentration.



Figure S14. PL spectra of PLVP-3 under different excitation wavelengths in DMF solutions.



Figure S15. (a) Excitation spectra and (b) UV-vis spectra of PLVP-3 in DMF solutions.



Figure S16. Excitation spectra (a) and PL spectra (b) of PLVP-1 in DMF solutions with different concentrations. (c-f) PL spectra of PLVP-1 in DMF solutions with different concentrations under different excitation wavelength.



Figure S17. Excitation spectra (a) and PL spectra (b) of PLVP-2 in DMF solutions with different concentrations. (c-f) PL spectra of PLVP-2 in DMF solutions with different concentrations under different excitation wavelength.



Figure S18. Excitation spectra (a) and PL spectra (b) of PLVP-4 in DMF solutions with different concentrations. (c-f) PL spectra of PLVP-4 in DMF solutions with different concentrations under different excitation wavelength.



Figure S19. Excitation spectra (a) and PL spectra (b) of PLVP-5 in DMF solutions with different concentrations. (c-f) PL spectra of PLVP-5 in DMF solutions with different concentrations under different excitation wavelength.



Figure S20. WAXS profiles of as-cast films and precipitated powders of P2VP and PMLA homopolymer.



Figure S21. Original PL spectra of the cast films and the precipitated powders of PLVPs. Solid line: cast film; dashed line: precipitated powder



Figure S22. PL spectra of cast film (a) and powder (b) of PLVP-3 under different excitation wavelengths.



Figure S23. PL spectra of casted films of PLVP-1, PLVP-2, PLVP-4 and PLVP-5 under different excitation wavelengths.



Figure S24. Normalized UV-vis absorbance spectra of cast PLVP films.



Figure S25. PL spectra of precipitated powders of PLVP-1, PLVP-2, PLVP-4 and PLVP-5 under different excitation wavelengths.



Figure S26. The optimized structures and molecular orbital of PMLA and P2VP based on m062x/6-311+g(d) method.



Figure S27. The HOMO energy levels of PLVPs measured by photoelectron spectrophotometer.



Figure S28. TGA curves of PLVPs.



Figure S29. Fluorescence lifetime decay curves (a) and dependence of fluorescence lifetimes of PLVP-3 (0.05 mM) with different concentrations of Fe^{3+} (b).



Figure S30. Normalized UV-vis absorbance spectra of PLVP-3 DMF solution with different ions.

Table S1. Effective ionic radii of ions.

Ion	Fe ³⁺	Na ⁺	Zn ²⁺	Co ²⁺	Ni ²⁺	Ga ³⁺	Eu ³⁺	Cu ²⁺
radius (pm) ¹	55	102	74	74.5	60	62	94.7	73
charge/radius ratio	0.054	0.0098	0.027	0.027	0.033	0.048	0.032	0.027

Reference:

[1] R. D. Shannon. Acta Crystallographica Section A. 1976, A32, 751-767.